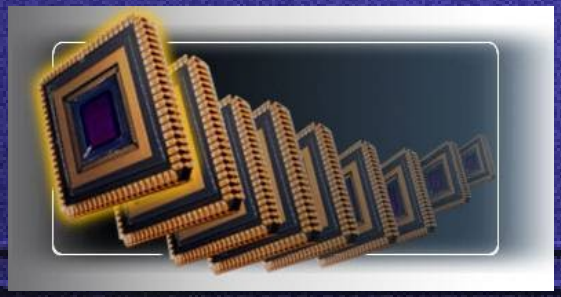
Office of the Secretary of Defense

DMSMS and Performance Based Logistics (PBL)

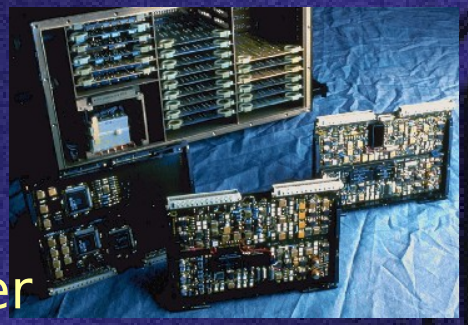
Ron Shimazu, DMEA
DoD DMSMS Working Group



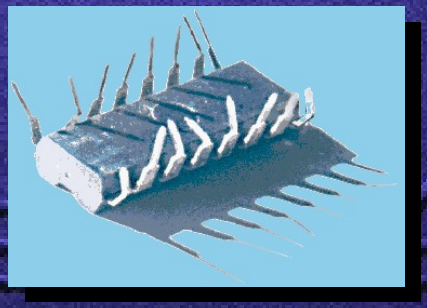
Definition

- What is *Diminishing Manufacturing Sources and Material Shortages (DMSMS)*?
  - (DoD Definition) The loss or impending loss of the ***last known*** manufacturer or supplier of raw material, production parts or repair parts
  - (Industry Definition) The loss or impending loss of the ***original*** manufacturer or supplier of raw material, production parts or repair parts
- *Obsolete Part*: A part of a larger system that is no longer manufactured by the original manufacturer.

Commodities Impacted by DMSMS



- Microelectronics - 83%
- Other - 17%
  - Bearings
  - Optics
  - Semiconductors
  - Switches
  - Control
  - Connectors
  - Resistors
  - Capacitors
  - Circuit Cards
  - Modules
  - Fiber
  - Tubes
  - Fire
  - Radar Equipment
  - ADP Equipment
  - Antennas



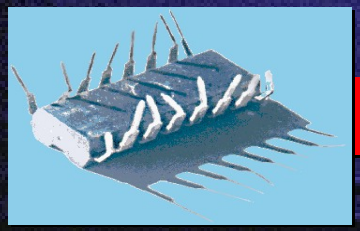
Factors Driving Microelectronics DMSMS

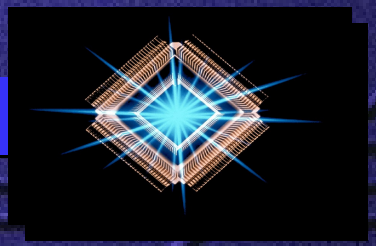
- **Prime Driver of DMSMS Situation - *Commercial Profit Motive*: *When a part is no longer economical to produce, manufacturers will move on to more profitable items*.**
- **The *Commercial Profit Motive* works against the military for two reasons:**
  - **Diminished Overall Demand:**
    - **Military customers "require" *specialized* parts (i.e., temp, voltage)**
    - **Commercial microcircuit users (computers, cell phones, etc.) now constitute—by far—the largest share of the market**
      - **Military share of the microcircuit market:**
        1975: 17% 1985: 7% 2002: ~0.3%

  - **Extended Support Periods:**
    - **Microcircuit life cycles average ~18 months (much less for memories)**
    - **DoD has long design-to-acquisition lead times**
    - **Extension of the service lives of systems**
    - **Support requirements for military systems outlast those of parts**
      - **Commercial electronic systems: 4 – 7 years**
      - **Military electronic systems: 25 – 30 years**

Government DMSMS Organizations

- DMEA (DoD DMSMS Executive Agent for Microelectronics)
- Services' DMSMS Focal Points
  - Army
  - Air Force
  - Navy
- DLA/DSCC
- GIDEP (DMSMS Database)
- DoD DMSMS Working Group





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DoD DMSMS Working Group

- Purpose
  - The DoD DMSMS Working Group is the DoD focal point for DMSMS initiatives for the Deputy Under Secretary of Defense (L & MR).
- Mission
  - The mission of the Working Group is to recommend management techniques, tools, and policies to increase readiness, sustain wartime operations, and reduce life-cycle costs of DoD weapon systems and materiel.
- Functions
  - Develop recommendations to DoD policy and procedures that will streamline regulations and practices to reduce DMSMS impacts and encourage aggressive and proactive management of DoD systems by both government and industry personnel.
  - Promote the utilization of DMSMS mgmt practices through education.
  - Coordinate DMSMS activities throughout government and industry to encourage leveraging efforts.

DMSMS Reference Documents

- Program Managers Handbook for Managing DMSMS
  - Managing DMSMS from Government perspective
- Cost Resolution Metrics
  - Cost Avoidance Methods by Managing DMSMS
- GEIA GEB1, DMSMS Best Practices, 2001
  - Managing DMSMS from Industry perspective
- DMSMS Acquisition Guidelines, December 2001
  - Contractual Strategies for Managing DMSMS
- Navy PBL Language
  - Navy examples of managing DMSMS via PBL
- TLCSM Template

Find all documents at
www.dmea.osd.mil

DMSMS Reality

- Bad News
  - DMSMS (Especially Microelectronics) is inevitable during the course of a System Acquisition
    - The Original Part/Board/System as well as the Replacement Part/Board/System
      - Can Never completely solve problem!!!

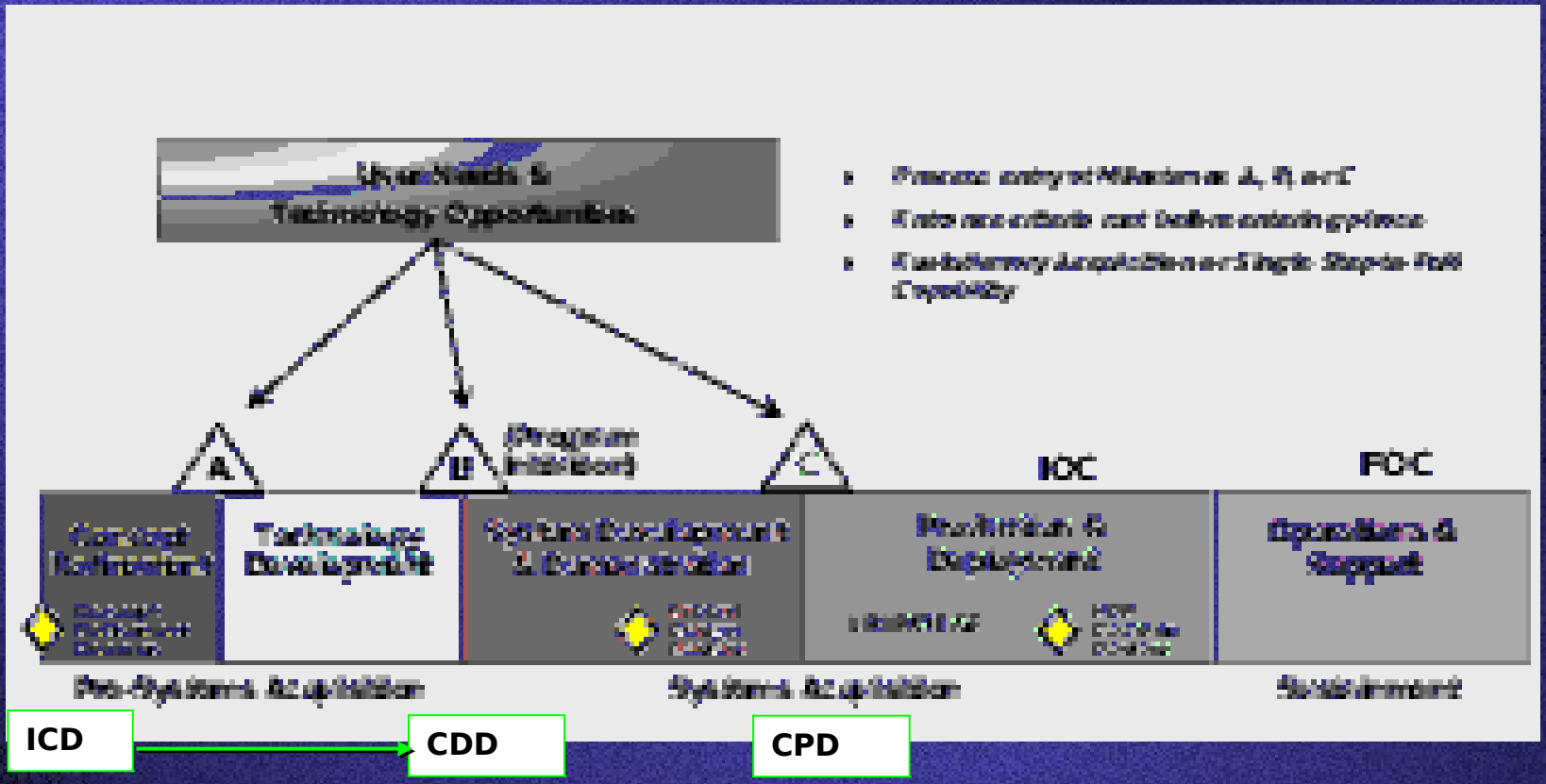
- Good News
  - Proactive DMSMS Management can control and limit Total Ownership Costs
    - B-2 program showed 6:1 ROI w/ Proactive DMSMS Management

Acquisition Strategies for Managing DMSMS through Lifecycle

- DoD Tools
  - DoD Template for Total Life Cycle Systems Management
    - Identifies Key DMSMS Considerations in each Phase to be integrated into Acquisition Strategy of System
  - Performance Based Logistics

- DMSMS Tools
  - DMSMS Acquisition Guidelines, December 2001
    - Identifies specific DMSMS elements to be incorporated into Statement of Work, based on Contractual Strategy of System
      - Considers types of Contracts (Fixed Price, Cost Reimbursement, etc) & Funding Types
  - Navy DMSMS PBL Document
    - Identifies different types of Logistics Contracts that address DMSMS elements

5000 Model



ICD: Initial Capabilities Document
CDD: Capabilities Development Document
CPD: Capabilities Production Document
IOC: Initial Operating Capability
FOC: Full Operating Capability
LRIP: Low-Rate Initial Production
OT&E: Operational Test and Evaluation
FRP: Full Rate Production

Figure 1

Key DMSMS Considerations during Life Cycle (From DoD Template for TLCSM)

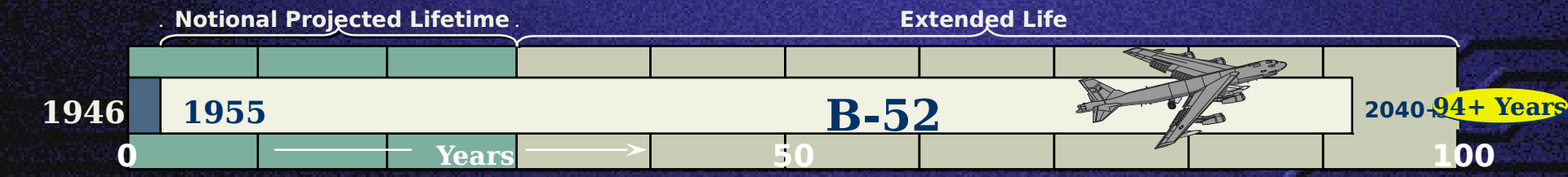
- During Concept Refinement & Technology Development Phase
  - Identify & Assess high risk dynamic (Ex. 12-18 month life cycle microelectronics) technologies
    - Assess impact on future development and production
  - Develop Technology Roadmaps that addresses DMSMS, and includes planned Technology Refresh cycle
  - Develop Rough Order of Magnitude (ROM) Life Cycle cost estimates

- Key Activities to be completed before Milestone B
  - Acquisition Strategies that address ex[illegible]S, and plann[illegible]y refresh cycles

Key DMSMS Considerations during Life Cycle (Cont)

- During SDD, Production, & Deployment Phases
  - Continued Identification & Assessment of high risk dynamic (Ex. 12-18 month life cycle microelectronics) technologies
    - Assess impacts on future Production and Sustainment
      - Particularly Spares purchases
  - Continued Update of Technology Roadmaps that addresses DMSMS, and includes planned Technology Refresh cycle
  - Update ROM Life Cycle cost estimates

- Key Activities to be completed
  - Continued update of Acquisition Strategies that address expected DMSMS, and planned technology refresh cycles



DMSMS Contractual Language for Use in Acquisition Phases

(From DMSMS Acquisition Guidelines)

Parts Obsolescence Monitoring

Circuit Design Guidelines
VHDL

PBL as Tool for Proactive DMSMS Management

- Features in PBL will encourage Proactive DMSMS Management
  - Performance Metrics
    - Replacement Part Availability Guarantees (85-90%)
      - Proactive Management will ensure projected obsolete parts have substitutes or

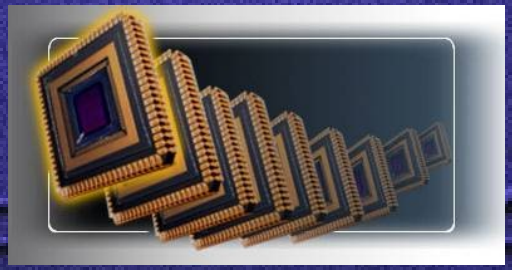
  - Fixed price PBL contracts
    - Will limit cost risk to government
      - Encourages low cost parts substitutions instead of costly redesigns
        - Maintains fit-form-function at Next Higher Assy

PBL as Tool for Proactive DMSMS Management (Cont.)

- Long Term Contracts w/ Award Term/Fee
  - Incentivizes Reliability & Maintainability improvements with valid ROI
    - Low reliability and projected obsolescence could impact future profitability

PBL Success Stories

- Navy has incorporated Obsolescence Management in many of their PBL's
  - Navy F-14 Night Target System PBL
    - $33M Savings over 8 yrs
  - E-2 Mission Computer
    - $14M savings over 15 years
  - ARC-210 Radio
    - $5.4M Savings over 5 years



PBL Matrix of DMSMS Activities – NAVICP PBL Document

	PBL-MSP	PBL-MSP+	PBL-O	LECP	PBL-C	Full Commercial
§ 0.0 Obsolescence Management Plan.	X	X	X	X	X	X
§ 1.0 Direct Responses to DMSMS Events (Reactive Approaches)	X	X	X	X	X	X
§ 1.1. DMSMS Alert Notices	X	X	X	X	X	X
§ 1.2. Alternate Sources	X	X	X	X	X	X
§ 1.3. Substitution		X	X	X	X	X
§ 1.4. Use a commercial part in lieu of a military part		X		X	A	X
§ 1.5. Emulation				X	A	X
§ 1.6. Life-of-Type buy	X	X	X	X	X	X
§ 1.7. Design Modifications			X	X	X	X
§ 1.8. Reverse Engineering				X	X	X
§ 1.9. Reclamation	X	X	X	X	X	X
§ 2.0. Management Techniques to manage DMSMS (Proactive Approaches)			X	X	X	X
§ 2.1. System Architecture Approaches				X	A	A
§ 2.1.1. Technology Independence through use of VHDL				X	A	A
§ 2.1.2. Software Portability				X	A	A
§ 2.3. Technology Insertion			X	X	X	X
§ 2.4. Planned System Upgrades					A	X
§ 2.5. Life Cycle Analysis & DMSMS Monitoring		A	A	X	X	X
§ 2.6. Supplier / Subcontractor Management	X	X	X	X	X	X
§ 2.7. Other System Design Approaches				X	A	A
§ 2.7.1. Part Selection Guidelines				X	A	A
§ 2.7.2. Part Documentation		X	X	X	A	A

DMSMS Summary

- DMSMS will Happen
  - There's no silver bullet
- DoD Initiatives can help manage DMSMS throughout Lifecycle
  - DoD Template for TLCSM
  - DMSMS Acquisition Guidelines
- PBL DMSMS Tool Encourages Proactive DMSMS Management – Saves DoD Money
- DoD DMSMS Working Group Supporting the Warfigh

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